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1. TITLE OF THE INVENTION: PRODUCTION OF POLY-3-HYDROBUTYRATE

3. DETAILED DESCRIPTION OF THE INVENTION:

(Example 1)

Using twelve 500 ml-Erlenmeyer flasks, cultivation was started in a rotary shaking incubator.

150 ml Of activated sludge adjusted to an MLSS of 4,000 mg/l was charged in each Erlenmeyer flask, and the experiment was started by adding thereto 150 ml of sodium acetate substrate adjusted to 10g-TOC/l and 20mg-N/l.

During the cultivation, one of the Erlenmeyer flasks was sampled with the passage of time to analyze the concentration of PHB, glycogen, acetate, and cell and the ratio of components over time.

Figure 1 shows the amount of TOC, acetate, and ammonia nitrogen over time.

Figure 2 shows the concentration of carbon in the cell,

PHB, and glycogen over time.

The amounts of TOC and acetate were exponentially decreased for 144 hours after the initiation of cultivation.

With this decrease, the concentration of carbon in the cell sharply increased, and the accumulation/formation of PHB and glycogen in the cell was also observed.

After 144 hours, when the culture medium was deficient in acetate, both energy storage products, however, tended to decrease.

Figure 3 shows the ratio of stored PHB or glycogen to consumed TOC over time.

At 17 hours, 35% of the TOC or more was utilized for glycogen formation, and later, glycogen formation decreased in a linear manner.

On the other hand, PHB synthesis was increased for 96 hours and then gently decreased.

The results show that there is a time lag between the formation/degradation of glycogen and PHB.

Next, an investigation was made for the rate of PHB formation and of glycogen formation in response to the TOC concentration of the culture medium.

As shown in Figure 4, the rate of glycogen formation was gradually reduced with the decrease in TOC concentration of the culture medium, and the synthesis stopped at a TOC concentration of 2.5 g/l. This indicates a gradual shift toward degradation as the concentration decreases.

On the other hand, the rate of PHB formation began to increase sharply at a TOC concentration of about 4 g/l, reached a maximum at 2.5 g/l, and thereafter decreased, indicating a gradual shift toward degradation.

Therefore, it is possible to suppress glycogen formation and to produce PHB efficiently when the concentration of carbon in the culture medium is constantly controlled at about 2.0-4.0 g/l.